

IN THE CLAIMS:

1. (Currently Amended) A semiconductor device manufacturing method, comprising the steps of:

forming a semiconductor film over an insulating surface;
forming a gate insulating film on the semiconductor film;
forming a gate electrode on the gate insulating film;
adding a first impurity to the semiconductor film while using the gate electrode as a mask;
forming a conductive film over the gate insulating film and the gate electrode;
forming a sidewall to a side surface of the gate electrode in a condition of the gate insulating film and the gate electrode being covered by the conductive film; and
adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks through the conductive film and the gate insulating film.

2. (Original) The semiconductor device manufacturing method according to claim 1, wherein the semiconductor device has a channel forming region with a channel length of 2.0 μm or shorter.

3. (Cancelled)

4. (Original) The semiconductor device manufacturing method according to claim 1, wherein the semiconductor device incorporates a logic circuit.

5. (Currently Amended) A semiconductor device manufacturing method, comprising the steps of:

forming a semiconductor film over an insulating surface;
forming a gate insulating film on the semiconductor film;
forming a gate electrode on the gate insulating film;
adding a first impurity to the semiconductor film while using the gate electrode as a mask;

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forming an insulating film over the gate insulating film and the gate electrode;
forming a conductive film over the insulating film;
forming a sidewall to a side surface of the gate electrode in a condition of the insulating film being covered by the conductive film; and

adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks through the conductive film, the insulating film and the gate insulating film.

6. (Original) The semiconductor device manufacturing method according to claim 5, wherein the semiconductor device has a channel forming region with a channel length of 2.0 μm or shorter.

7. (Cancelled)

8. (Original) The semiconductor device manufacturing method according to claim 5, wherein the semiconductor device incorporates a logic circuit.

9. (Currently Amended) A semiconductor device manufacturing method, comprising the steps of:

forming a semiconductor film over an insulating surface;
forming a gate insulating film on the semiconductor film;
forming a gate electrode on the gate insulating film;
adding a first impurity to the semiconductor film while using the gate electrode as a mask;
forming a conductive film over the gate insulating film and the gate electrode;
forming a sidewall to a side surface of the gate electrode in a condition of the gate insulating film and the gate electrode being covered by the conductive film;
adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks;
removing the sidewall; and
removing the conductive film after removing the sidewall.

10. (Original) The semiconductor device manufacturing method according to claim 9, wherein the semiconductor device has a channel forming region with a channel length of 2.0 μm or shorter.

11. (Original) The semiconductor device manufacturing method according to claim 9, wherein the second impurity is added through the conductive film and the gate insulating film.

12. (Original) The semiconductor device manufacturing method according to claim 9, wherein the semiconductor device incorporates a logic circuit.

13. (Currently Amended) A semiconductor device manufacturing method, comprising the steps of:

- forming a semiconductor film over an insulating surface;
- forming a gate insulating film on the semiconductor film;
- forming a gate electrode on the gate insulating film;
- adding a first impurity to the semiconductor film while using the gate electrode as a mask;
- forming an insulating film covering the gate insulating film and the gate electrode;
- forming a conductive film over the insulating film;
- forming a sidewall to a side surface of the gate electrode in a condition of the insulating film being covered by the conductive film;
- adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks;
- removing the sidewall; and
- removing the conductive film after removing the sidewall.

14. (Original) The semiconductor device manufacturing method according to claim 13, wherein the semiconductor device has a channel forming region with a channel length of 2.0 μm or shorter.

15. (Original) The semiconductor device manufacturing method according to claim 13, wherein the second impurity is added through the conductive film, the insulating film and the gate insulating film.

16. (Original) The semiconductor device manufacturing method according to claim 13, wherein the semiconductor device incorporates a logic circuit.

17. (Original) A semiconductor device manufacturing method, comprising the steps of:

- forming a semiconductor film over a substrate;
- forming a gate insulating film on the semiconductor film;
- forming a conductive film on the gate insulating film;
- forming a gate electrode on the conductive film;
- adding a first impurity to the semiconductor film while using the gate electrode as a mask;
- forming a sidewall to a side surface of the gate electrode in a condition of the gate insulating film being covered by the conductive film; and
- adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks through the conductive film and the gate insulating film.

18. (Original) The semiconductor device manufacturing method according to claim 17, wherein the semiconductor device has a channel forming region with a channel length of 2.0 μm or shorter.

19. (Original) The semiconductor device manufacturing method according to claim 17, wherein the first impurity is added through the conductive film and the gate insulating film.

20. (Original) The semiconductor device manufacturing method according to claim 17, wherein the semiconductor device incorporates a logic circuit.

21. (Original) A semiconductor device manufacturing method, comprising the steps of:

forming a semiconductor film over a substrate;

forming a gate insulating film on the semiconductor film;

forming a conductive film on the gate insulating film;

forming a gate electrode on the conductive film;

adding a first impurity to the semiconductor film while using the gate electrode as a first mask;

forming a sidewall over the conductive film to a side surface of the gate electrode, the gate insulating film being covered by the conductive film;

adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks;

removing the sidewall; and

processing the conductive film while using the gate electrode as a second mask.

22. (Original) The semiconductor device manufacturing method according to claim 21, wherein the semiconductor device has a channel forming region with a channel length of 2.0 μm or shorter.

23. (Original) The semiconductor device manufacturing method according to claim 21, wherein the first impurity is added through the conductive film and the gate insulating film.

24. (Original) The semiconductor device manufacturing method according to claim 21, wherein the second impurity is added through the conductive film and the gate insulating film.

25. (Original) The semiconductor device manufacturing method according to claim 21, wherein the semiconductor device incorporates a logic circuit.

26. (New) A semiconductor device manufacturing method, comprising the steps of:
forming a semiconductor film over an insulating surface;
forming a gate insulating film on the semiconductor film;
forming a gate electrode on the gate insulating film;
adding a first impurity to the semiconductor film while using the gate electrode as a mask;
forming a conductive film over the gate insulating film and the gate electrode;
forming a sidewall having insulating property to a side surface of the gate electrode in a condition of the gate insulating film and the gate electrode being covered by the conductive film;
adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks;
removing the sidewall; and
removing the conductive film.

27. (New) The semiconductor device manufacturing method according to claim 26, wherein the conductive film is removed after removing the sidewall.

28. (New) A semiconductor device manufacturing method, comprising the steps of:
forming a semiconductor film over an insulating surface;
forming a gate insulating film on the semiconductor film;
forming a gate electrode on the gate insulating film;
adding a first impurity to the semiconductor film while using the gate electrode as a mask;
forming an insulating film covering the gate insulating film and the gate electrode;
forming a conductive film over the insulating film;
forming a sidewall having insulating property to a side surface of the gate electrode in a condition of the insulating film being covered by the conductive film;
adding a second impurity to the semiconductor film while using the gate electrode and the sidewall as masks;
removing the sidewall; and

removing the conductive film.

29. (New) The semiconductor device manufacturing method according to claim 28, wherein the conductive film is removed after removing the sidewall.